

# FRESH WATER SPILL 2004 SYMPOSIUM

## Oil Spill Preparedness and Response in the Amazon Region -- Lessons Learned From Drills and Exercises

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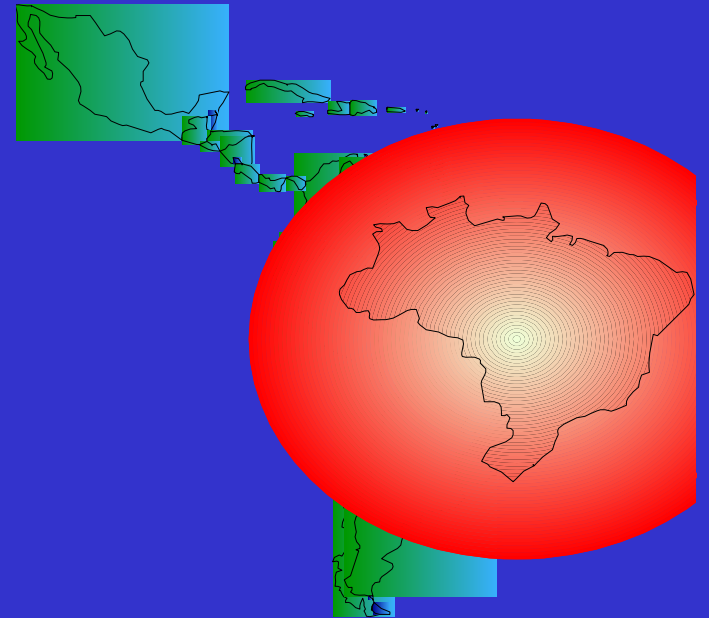
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**PAULO GUSTAVO**

*Petroleo Brasileiro S.A - PETROBRAS*

**PAULO MÓISES**

*Alpina Briggs*







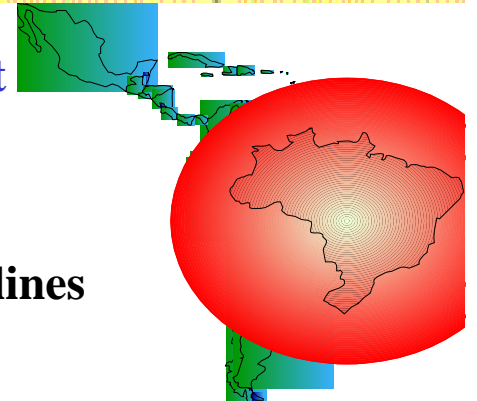
**URUCU Oil & Gas Production + Natural Gas Processing Plant**

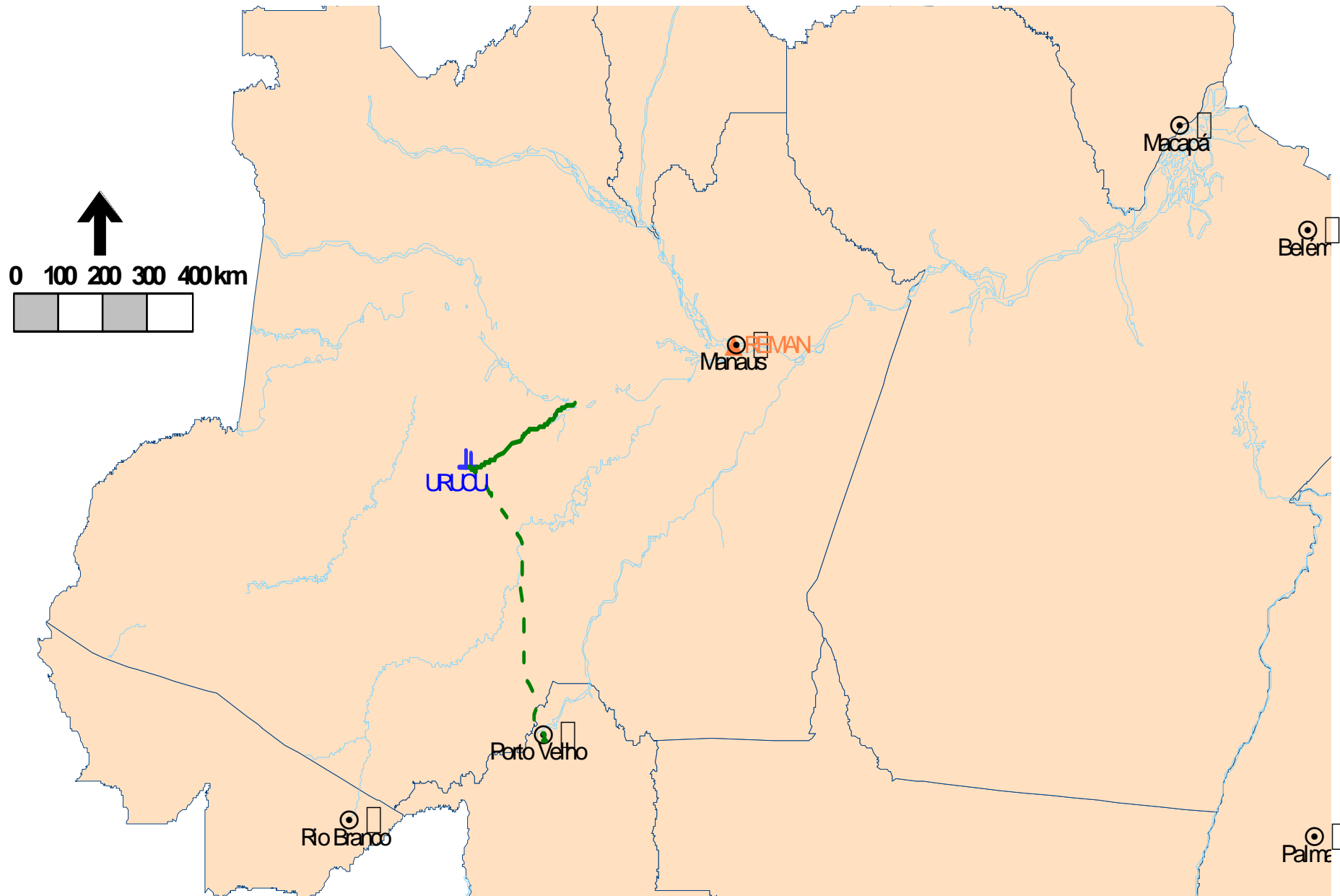
**COARI River Terminal**

**MANAUS Refinery**

→ **Oil & Gas Pipelines**

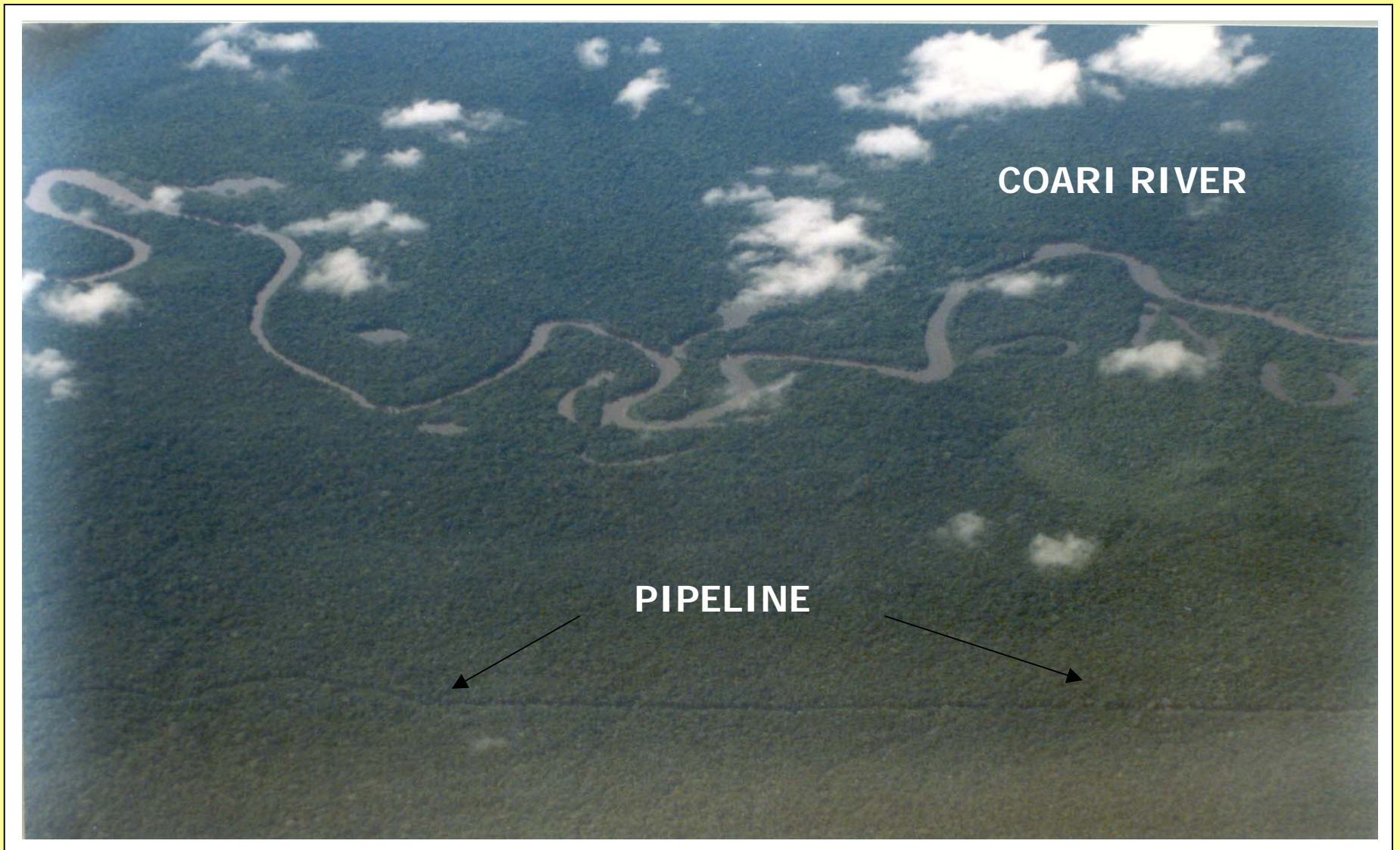
--- **Future Pipelines**





OIL & GAS INDUSTRIAL  
INSTALLATIONS AND  
ACTIVITIES IN THE AMAZON  
REGION

***Aerial View of the Installations and  
Surrounding Environment***



## ***Aerial View of the Installations and Surrounding Environment***

**Flooded vegetation at the mouth of the Urucu River**



# ***Aerial View of the Installations and Surrounding Environment***



**(Solimões River Terminal)**



# GEOGRAPHICAL VIEW



# **Drills and Exercises**

## **Accidental Scenarios Selection Criteria**

- Security, Health and Environment involvement.
- High Environmental Damage Potential.
- Possibilities for near-by communities involvement.
- Feasibility

# Drills and Exercises

## Accidental Scenario -- DRILL #1

- **Collision of two Diesel Oil Transportation Vessels**
  - Injured Victims.
  - Oil spill in Rio Negro waters (29m<sup>3</sup>/h.).
  - Possible shipwreck.
  - Possible contamination of river margins and fishery areas.

## Drills and Exercises

### **Accidental Scenario -- DRILL #2**

- **Complete Rupture of the Hose Connection at the Dock, during a Vessel Loading Operation**
  - Firing and Explosion in the Terminal Dock
  - Casualties and Injured Victims.
  - Oil spill in Rio Solimoes waters (10m<sup>3</sup>)
  - Possible contamination of the Coari community water supply, river margins and fishery areas.

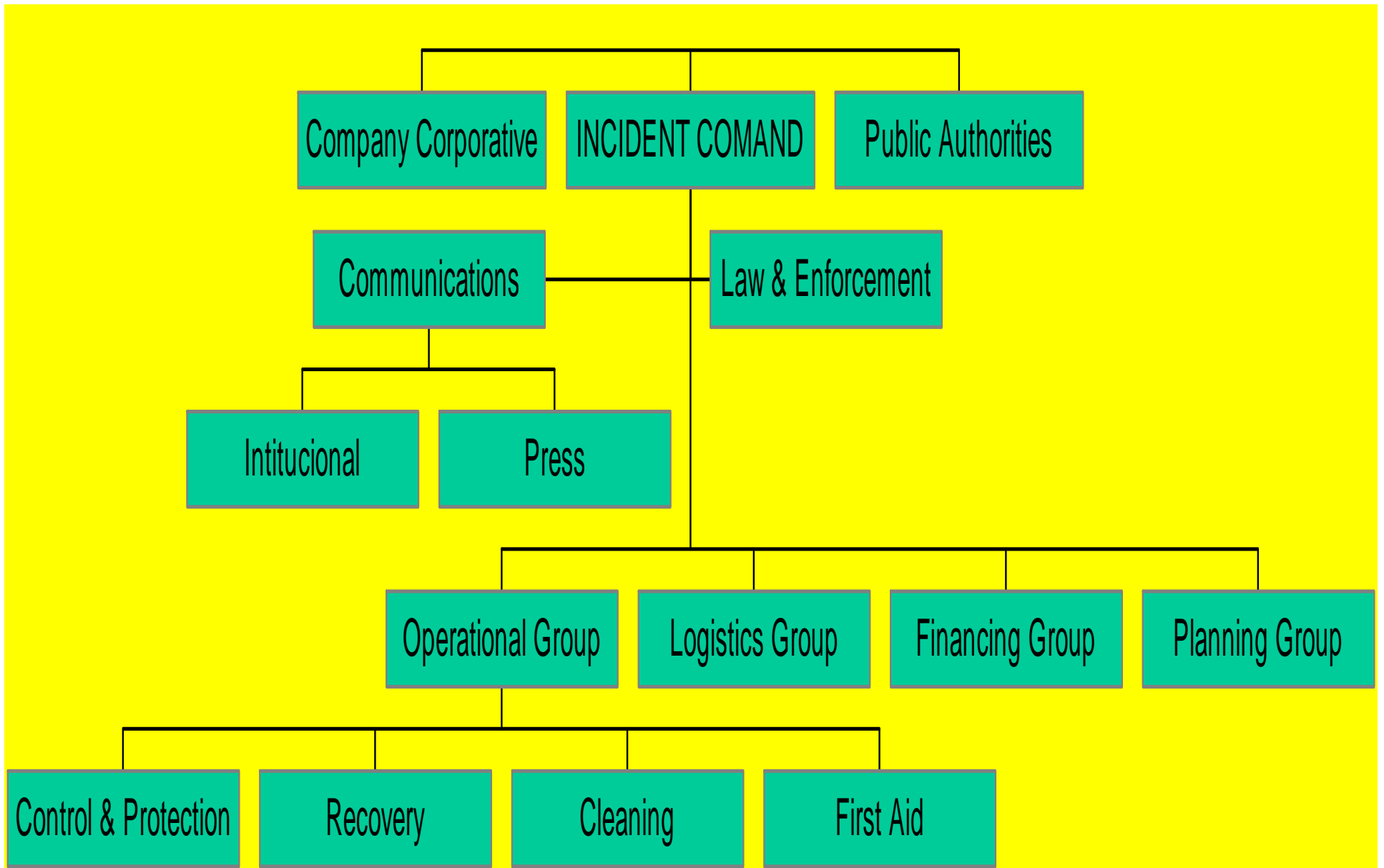
# Drills and Exercises

(DRILL #2)

## Basic Response Structure

- Emergency Response Organization
- Human and Material Resources
- Available Logistics

# Emergency Response Structure



# Available Material Resources

(ready for immediately assignments)

MATERIAL □	QUANT. □
BOOM - SEAFENCE type	830 m
EGMOPOL (barge with recovery facility)	01
Workboat (fast response landing craft)	03
SKIMER-PAK (lightweight weir type)	04
SKIMER-ROOL (industrial type 16 ton./h)	01
Tank (Inflatable, floating structure)	01
Tank (inflatable, self-supporting structure)	01
Support boats & small fast motor boats(boom, skimmers and personnel)	20
COARI Terminal Full Fire Combat Structure	01

# Available Resources

(At the Environment Defense Center in Manaus)

MATERIAL □	QUANT. □
High Volume Skimmer System - HVSS	01
Containment Booms type Current Booster	150 m
Containment Booms type SEAFENCE	14500 m
Muck Heavy Crane Trucks	02
Ferry Boats	04
· Transport of "Oil Fake" material	
· Waste Recovery	
· Wild Life Rehabilitation Unit	
· Transport of the HVSS Equipment	
Propellers boats for the barges	10
Fast small motor boats	15
Truck Communication System	40
Personal	55
Current Flow measure device	01
Helicopter	01
Small planes	02
Pick up	02
Boat for temporary residence	01



# Human Resources

TEAMS	QUANT.
Coari Terminal Fire Brigade	17
First Aid (medical(02), nursing (05) ; paramedical (07))	14
Oil Pollution	110
Terminal Operation Staff	08
Faking fatal casualties and injured people	10
General Command	02
Land support	02
River support	08
Fishery community	27
Observers	17
Maintenance	04
Health, Security and Environment Sector	04
Logistics	06
Environment Defense Center	55
TOTAL	284

# CONTAINMENT BOOMS



# BASIC RESPONSE EQUIPMENTS



# EGMOPOL Oil Recovery Equipment



# PERMANENT TRAINING



# The Amazon Oil Spill Drill and Exercise Performance

# PREPARING FOR ACTION





29 10 2003



# BRINGING REALISM TO THE VICTIMS





# INCIDENT PRIMARY EVENT



# FIRST EMERGENCY ACTIONS







29 10 2003

# SIMULATING THE OIL SPILL



# THE OIL SPILL SPREAD OUT





# GETTING THE MIDDLE RIVER



# THE RESPONSE ACTION





29 10 2003

# THE “OIL” CONTAINMENT AND RECOVERY



# AERIAL SURVEILLANCE







# “OIL” RECOVERY ACTIONS









# “OIL STORING ACTIONS



# DISCUSSING AND EVALUATING THE DRILL





# Amazon Drills and Exercises

## Critical Analysis - **STRONG POINTS**

- The Drill Planning
- People commitment
- External communication, highlight for the creation of a “Press Room” in the near town of Coari
- Understanding and integration with local and state authorities
- Oil recovery operation performance

# Amazon Drills and Exercises

## Critical Analysis - **STRONG POINTS**

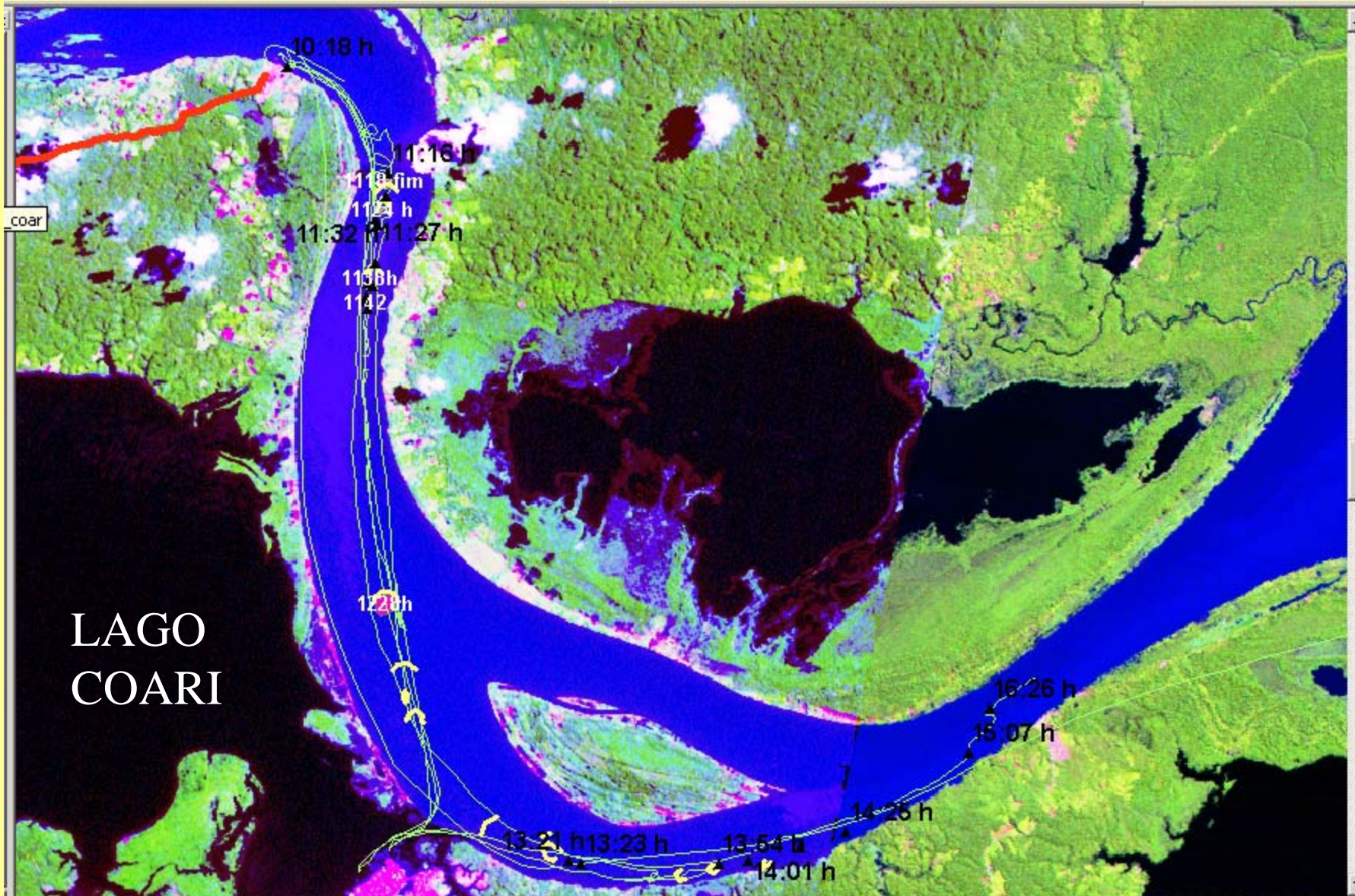
- Correct response from the “Predictive Oil Dispersion Model”
- The presence of external and independent “Observers”
- The performance of the INFOPAE, a potent software that can provide a complete set of “all nature” data and information available to support the “Operational Decisions” and a full on-line report of all relevant accident response fact

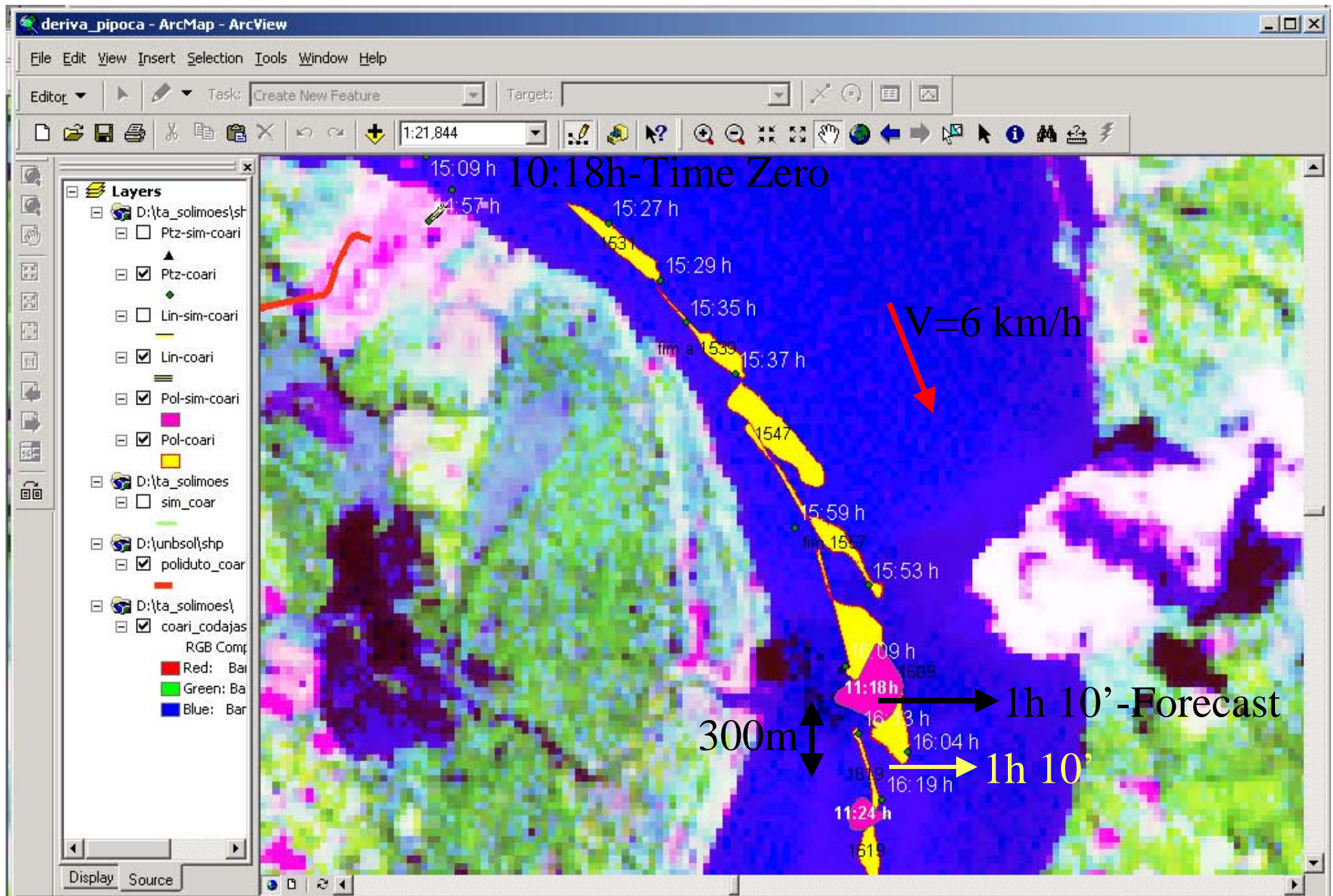
**INFOPAE**

**PERFORMANCE AT THE  
DRILL**



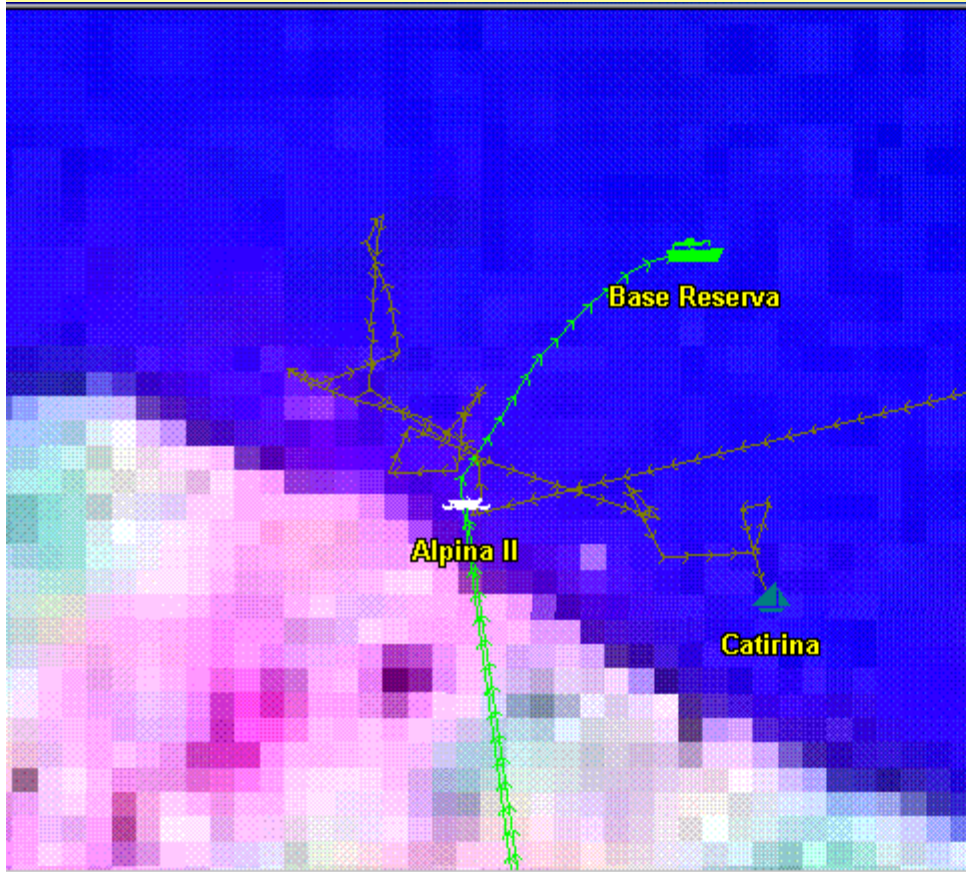
# DRILL SCENARIO





**FORECAST RESULTS (22.10.03) X RESULTS  
AT THE DRILL (29.10.03)**

# SITUATION AT 10:38 hs.

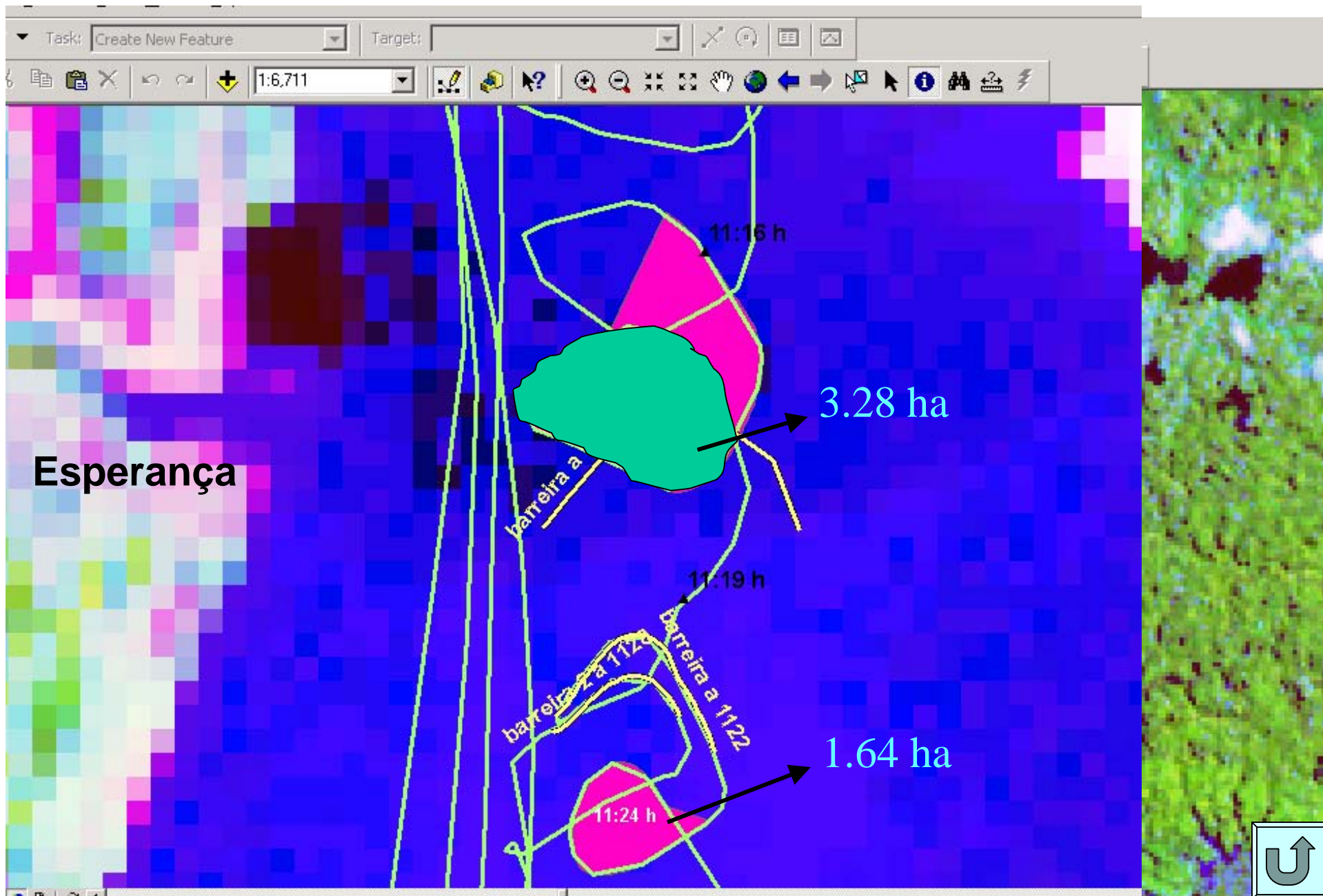


Veh. ID	Veh. Name	Report Time	Position Time
0004	Alpina II	11:30:44, 29/10/2003	12:29:27, 29/10/2003
0001	Base Reserva	11:41:06, 29/10/2003	12:39:52, 29/10/2003
0002	Ararajuba	15:52:26, 10/05/2002	16:52:51, 10/05/2002
0005	Alpina III	16:25:11, 23/09/2003	12:16:26, 23/09/2003
0006	Mergulhão	16:42:04, 23/09/2003	17:40:46, 23/09/2003
0007	Reman I	16:23:39, 23/09/2003	17:22:22, 23/09/2003
0008	Catirina	11:41:19, 29/10/2003	12:40:02, 29/10/2003
0009	Maite	15:49:29, 23/09/2003	16:48:05, 23/09/2003
0003	Alpina I	15:42:19, 23/09/2003	16:41:02, 23/09/2003

# 10:59 h

Veh. ID	Veh. Name	Report Time	Position Time	Latitude	Longitude	Speed	Course	Position	Source
0001	Base Reserva	11:59:06, 29/10/2003	12:57:52, 29/10/2003	03°57'03" S	63°08'48" W	6.41 KPH	163 Deg.	New	GPS
0002	Ararajuba	15:52:26, 10/05/2002	16:52:51, 10/05/2002	03°08'54" S	59°57'25" W	0.00 KPH	0 Deg.	New	GPS
0005	Alpina III	16:25:11, 23/09/2003	12:16:26, 23/09/2003	03°08'54" S	59°57'26" W	0.00 KPH	0 Deg.	Old	GPS
0006	Mergulhão	16:42:04, 23/09/2003	17:40:46, 23/09/2003	03°08'55" S	59°57'25" W	0.00 KPH	105 Deg.	New	GPS
0007	Reman I	16:23:39, 23/09/2003	17:22:22, 23/09/2003	03°09'03" S	59°57'04" W	0.00 KPH	0 Deg.	New	GPS
0008	Catirina	11:59:14, 29/10/2003	12:57:57, 29/10/2003	03°56'38" S	63°09'34" W	12.85 KPH	264 Deg.	New	GPS
0009	Maite	15:49:29, 23/09/2003	16:48:05, 23/09/2003	03°09'04" S	59°57'02" W	9.65 KPH	247 Deg.	New	GPS

# OPERATIONS DETAIL



12:09h



# Amazon Drills and Exercises

## Critical Analysis - **POINTS TO IMPROVE**

- The Drill Planning
- Firing Control Response
- Victims Rescue Operation from the accident scenario
- Logistics to remove of the very injured casualties to more advanced medical care centers
- Definition of the command and leaders tasks

# Amazon Drills and Exercises

## Critical Analysis - **POINTS TO IMPROVE**

- Integration and sufficiency of the “first aid” and medical care team with the Response Command
- The “TV” surveillance system of the Terminal
- Integration and more participation of the Environmental Agency
- News and “briefing” about the casualties for the work colleagues



# THANKS FOR YOUR ATTENTION

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